Organic Chemistry c3444y

4th Hour Exam

Wednesday, April 19, 2000
Prof. Leighton

Name:_____ **ID#**_____

Signature:_____

- Write your name on every page.
- The exam is 5 pages long (*not* including this one). Please make sure you have all of the pages.
- Write complete ***but succinct*** answers. **Good Luck!**

Question 1 (20 pts): _____

Question 2 (25 pts): _____

Question 3 (20 pts): _____

Question 4 (20 pts): _____

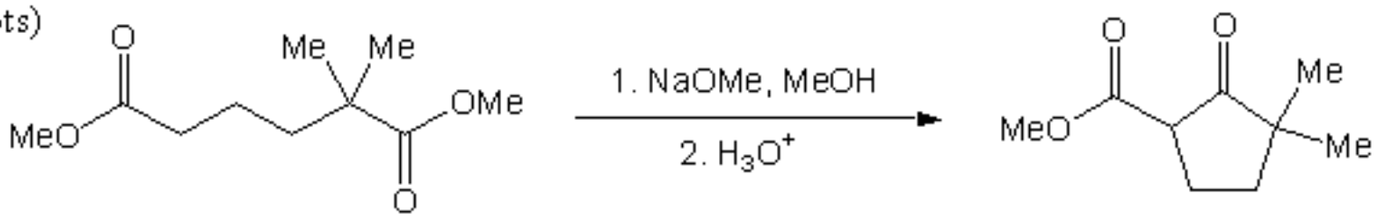
Question 5 (15 pts): _____

Total (100 pts):_____

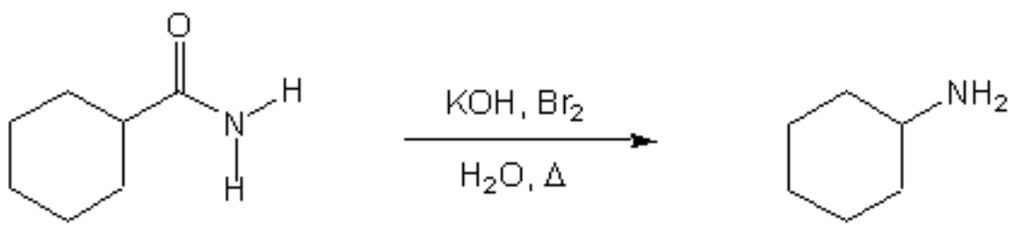
Name: _____

1. Provide detailed mechanisms for the following transformations:

a. (10 pts)



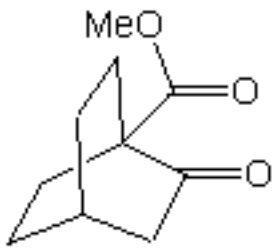
b. (10 pts)

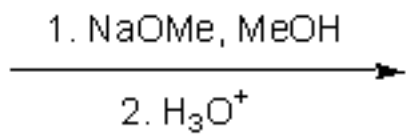


Name: _____

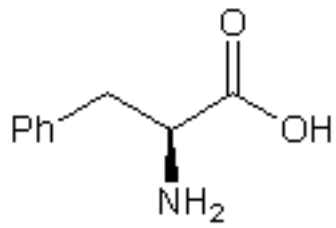
2. Predict the major product of the following reactions:

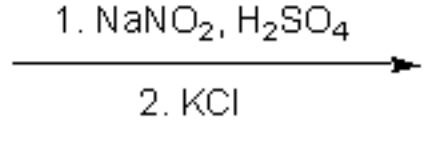
a. (9 pts)



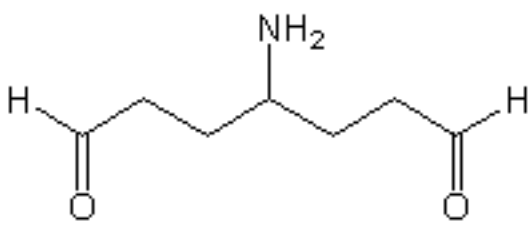


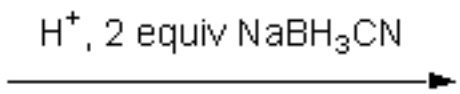
b. (8 pts)





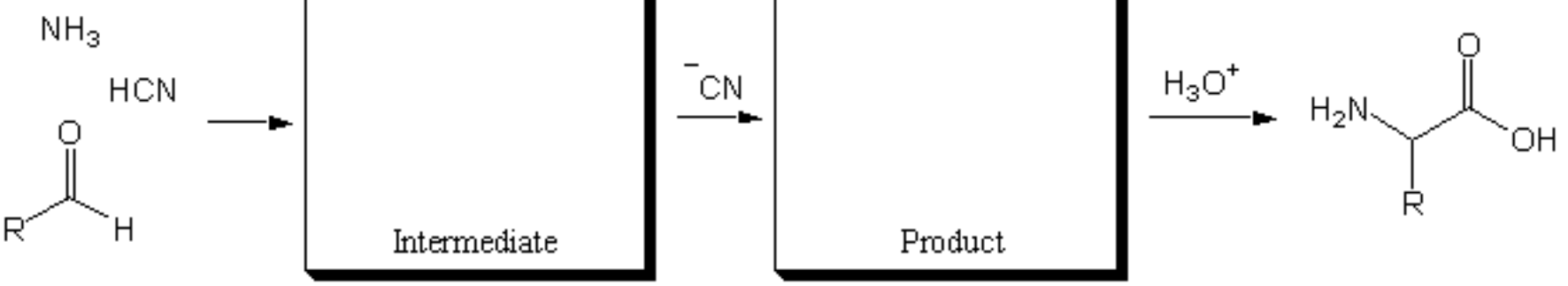
c. (8 pts)



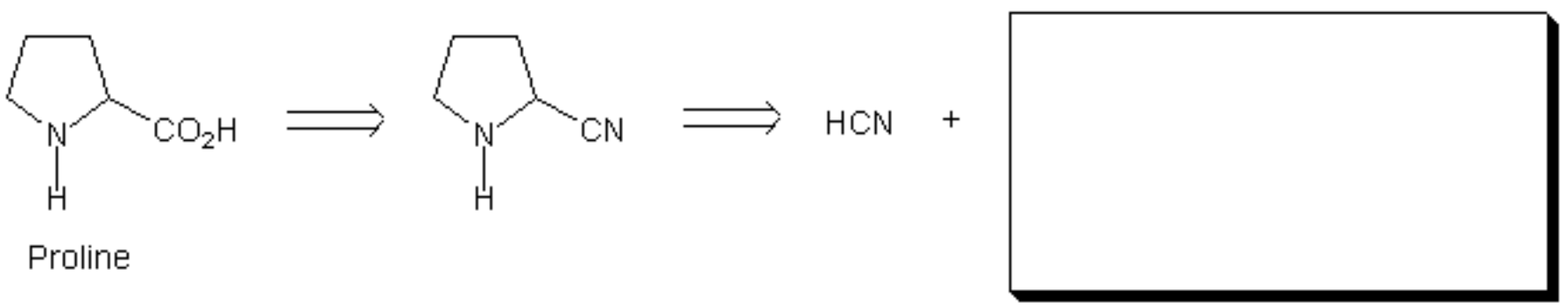


Name: _____

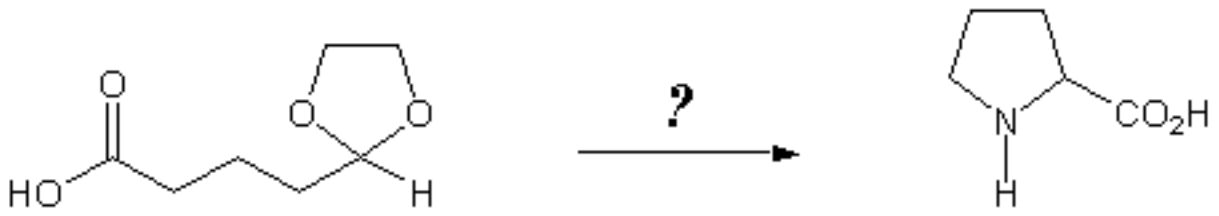
3. a. (6 pts) The Strecker reaction involves the combination of an amine, an aldehyde, and HCN. In the first part of the reaction the amine and aldehyde combine to form an intermediate, which reacts with cyanide in the second part of the reaction. Identify the intermediate and the product of the second part.



b. (14 pts) Working backwards, show the required reagent(s) for a Strecker synthesis of proline. Then show in the forward direction how you would synthesize proline from the given starting material.



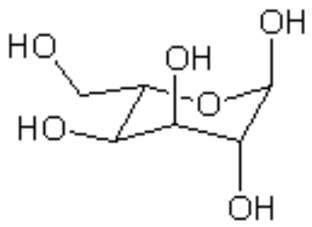
Proline



Proline

Name: _____

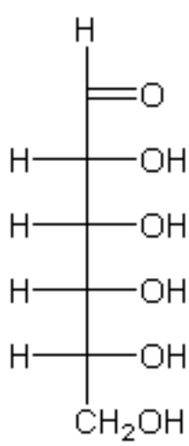
4. a. (10 pts) Provide a Fischer projection and a classification (*e.g.* D-ketotetrose) for the following carbohydrate:



Fischer Projection

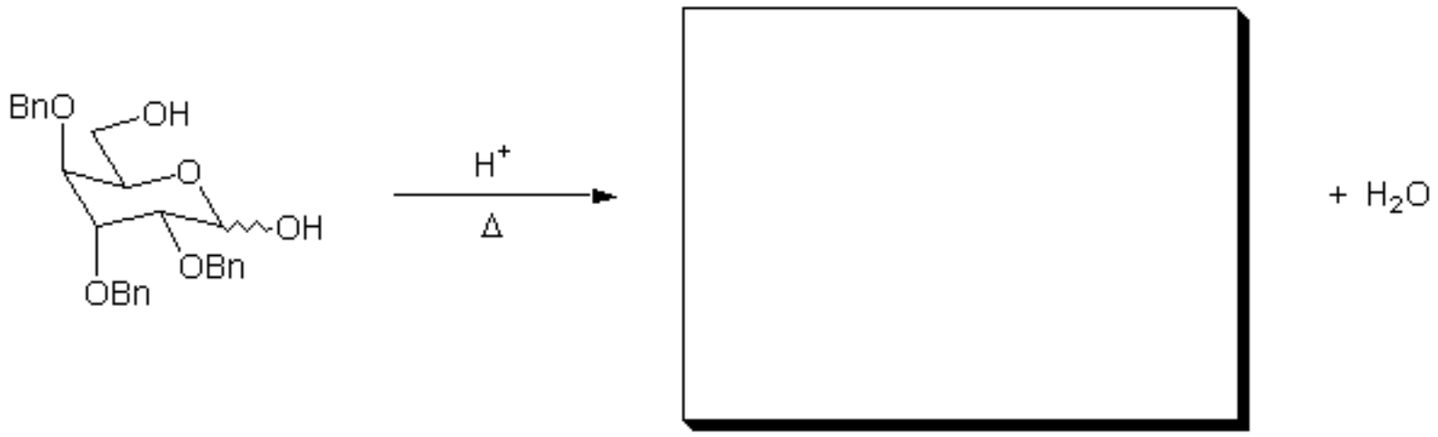
Classification

b. (10 pts) Provide a clear drawing of the most stable **β-PYRANOSE** form of the following ketohexose.



Name: _____

5. a. (10 pts) When the illustrated carbohydrate is heated in acid, a new compound is produced along with H_2O. The reaction does not proceed if the primary alcohol is also protected as a benzyl ether. Show the structure of this new compound.



b. (5 pts) Why might you expect this process to be more difficult with the carbohydrate shown here, than with the one shown above?